

IN THE DRAWINGS:

The attached replacement sheet includes a correction to Figure 5(b). The correction changed the high range on the vertical axis from 1 to 9.

Attachment: Replacement Sheet 4/4

REMARKS/ARGUMENTS

The Applicant originally submitted Claims 1-16 in the application. In the present response, the Applicant has amended Claims 1, 5-9 and 13-15 and added Claims 17-20. No subject matter has been added to the pending claims, which is not included in the original specification. No claims have been canceled. Accordingly, Claims 1- 20 are currently pending in the application.

I. Formal Matters and Objections

The Examiner has objected to Figure 5(b) for illustrating a different range than the range discussed in the detailed description. In response, the Applicant has amended Figure 5(b) to comport with the detailed description in the original application. Accordingly, the Applicant requests that the Examiner withdraw the objection of Figure 5(b).

The Examiner has also objected to Figure 2 asserting that the legend “Prior Art” is needed since “only that which is old is illustrated.” (See Examiner’s Action, page 2.) The Applicant respectfully disagrees.

As discussed below in more detail with respect to the Stanton reference, Figure 2 does not illustrate only that which is old. On the contrary, Figure 2 illustrates a Kalman filter employed in an exemplary embodiment of the present invention. More specifically, the Kalman filter illustrated in Figure 2 receives predictive information from a pre-existing model (predictive model 16) instead of from a model based on a pattern and operating state as disclosed in Stanton. Accordingly, the Applicant respectfully requests the Examiner to withdraw the objection to Figure 2.

The Examiner has objected to the specification for containing an informality. In response, the Applicant has amended paragraph 29 of the original application to correct this informality.

Accordingly, the Applicant respectfully requests the Examiner to withdraw the objection to the specification.

The Examiner has also objected to Claim 16 for being identical to Claim 15. In response the Applicant amended Claim 15 to depend on Claim 13. Accordingly, the Applicant respectfully requests the Examiner to withdraw the objection to the specification.

II. Rejection of Claims 1-4 and 9-12 under 35 U.S.C. §102

The Examiner has rejected Claims 1-4 and 9-12 under 35 U.S.C. §102(b) as being anticipated by the article entitled “Initial Wafer Heating Analysis for a SCALPEL Lithography System” written by Stanton, *et al.* The Applicant respectfully disagrees.

Stanton is directed to a sub-field position correction strategy for a high-throughput Scattering with Angular Limitation Projection Electron-beam Lithography (SCAPEL) tool. (*See* paragraph 1, page 235.) Stanton does not teach, however, producing predictive information related to a projection electron lithography process based on at least one pre-existing model and controlling placement of a beam of electrons based on the predictive information and measurement information as recited in independent Claims 1 and 9. Instead, Stanton discloses a lithography system including a Kalman filter methodology for the sub-field correction that receives input from a model based on a pattern and an operating state. (*See* section 5, pages 237 to 238 and Figure 5, page 238.) Thus, Stanton teaches employing a model that is not pre-existing but a model that relies on the present operating state of the system.

Stanton, therefore, does not teach each element of independent Claims 1 and 9 and Claims dependent thereon. Thus, Stanton does not anticipate Claims 1-4 and 9-12. Accordingly, the

Applicant respectfully requests the Examiner to withdraw the §102 rejection with respect to Claims 1-4 and 9-12 and allow issuance thereof.

III. Rejection of Claims 1-3, 5-11 and 13-16 under 35 U.S.C. §102

The Examiner has rejected Claims 1-3, 5-11 and 13-16 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,243,158 to Shiraishi. The Applicant respectfully disagrees.

Shiraishi is directed to a projection exposure method that can improve alignment precision without sacrificing throughput. (*See* column 1, lines 9-15 and column 2, lines 62-64.) Shiraishi does not teach, however, producing predictive information related to a projection electron lithography process based on at least one pre-existing model and controlling placement of a beam of electrons based on the predictive information and measurement information as recited in independent Claims 1 and 9. Instead, Shiraishi discloses a computation unit that derives new baseline data (data that indicates a positional relationship between a projection point of a mask pattern image and a detection point of a mark detection system) based on a predetermined computation in accordance with present and previous baseline data. An alignment device then aligns a projected image of a mask pattern with a substrate in accordance with the position of the alignment mark on the substrate and the new baseline data derived by the computation unit. (*See* column 3, lines 28-45.) Thus, Shiraishi does not employ a pre-existing model but uses a computation unit to derive baseline data based on present baseline data.

Shiraishi, therefore, does not teach each element of independent Claims 1 and 9 and Claims dependent thereon. Thus, Shiraishi does not anticipate Claims 1-3, 5-11 and 13-16.

Accordingly, the Applicant respectfully requests the Examiner to withdraw the §102 rejection with respect to Claims 1-3, 5-11 and 13-16 and allow issuance thereof.

IV. Rejection of Claims 4 and 12 under 35 U.S.C. §103

The Examiner has rejected Claims 4 and 12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,177,218 to Felker, *et al.* The Applicant respectfully disagrees.

As discussed above, Shiraishi does not teach producing predictive information related to a projection electron lithography process based on at least one pre-existing model and controlling placement of a beam of electrons based on the predictive information and measurement information as recited in independent Claims 1 and 9. Additionally, Shiraishi does not suggest producing predictive information related to a projection electron lithography process based on at least one pre-existing model and controlling placement of a beam of electrons based on the predictive information and measurement information since Shiraishi discloses computing base line data information employing present state base line information. (*See* column 3, lines 8-59.)

Felker has not been cited to cure the above discussed deficiencies of Shiraishi but to teach a SCALPEL system. (*See* Examiner's Action, page 8.) Felker is directed to a lithographic process for device fabrication in which charged particle energy is used to delineate a pattern in an energy sensitive material. (*See* column 1, lines 13-18.) Accordingly, the cited combination of Felker and Shiraishi does not teach or suggest each element of independent Claims 1 and 9 and does not provide a *prima facie* case of obviousness of Claims 4 and 12 which depend on Claims 1 and 9, respectively. Thus, Claims 4 and 12 are not unpatentable over the cited combination and the Applicants respectfully request the Examiner to withdraw the §103 rejection and allow issuance thereof.

V. Comment on Cited References

The Applicants reserve further review of the references cited but not relied upon if relied upon in the future.


VI. Conclusion

In view of the foregoing amendment and remarks, the Applicant now sees all of the Claims currently pending in this application to be in condition for allowance and therefore earnestly solicits a Notice of Allowance for Claims 1-20.

The Applicant requests the Examiner to telephone the undersigned attorney of record at (972) 480-8800 if such would further or expedite the prosecution of the present application. The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 08-2395.

Respectfully submitted,

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Dated:

1/31/05

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